

A semiconductor manufacturing apparatus and a method for processing a surface of a substrate are provided, which can realize a process at a constant etching rate, a low microloading effect, high selectivity, high reproducibility, and high dimensional controllability. The semiconductor manufacturing apparatus generates plasma by supplying electromagnetic waves to a gas atmosphere and processes the surface of the substrate with charged species in the plasma accelerated by a bias voltage applied to the substrate. At least the bias voltage is measured and at least the electrical power of the electromagnetic waves is controlled such that the bias voltage is controlled.

[illegible]